

RadHard Frequently Asked Questions

Q: Is there need for dynamic or static burn-in after programming?

A: There is no need for additional burn-in after the units have been programmed. Static and dynamic burn-in are included in the manufacturing flow for all RH1280 devices.

Q: Are 172 CQFP sockets available that withstand Military temperatures (-55°C to +125°C)?

A: The 172-CQFP socket Actel uses for military temperature testing is a custom socket made by Yamaichi (part number IC51-196-1952).

Q: Are there statistics for parts failing after burn-in?

A: Since units are tested at LMFS, Actel does not have detailed information on units that fail electrical tests after burn-in. However, we do receive the test summaries & travelers so we know the number of failures is very small (the test flow includes PDA calculations that must be met in order for the lot to ship). As for test failure modes after burn-in, the data belongs to LMFS.

Q: What software revision is required to program the RH1280?

A: Designer 3.0 or 3.1 may be used to program the RH1280. Designer 3.0 had a patch to include the RH1280 0 and 300krad timer. This patch is automatically included in Designer 3.1. Note that the RH1280 die is identical to the A1280XL die, so a fuse file generated for an A1280XL die will also program the RH1280.

Q: Does the Activator need periodic calibration? What is the calibration procedure?

A: The Activator is calibrated before the hardware is shipped. No additional calibration is necessary throughout the lifetime of the Activator. Actel provides diagnostic tests which can be used to verify the Activator is properly calibrated. The procedure for running Activator diagnostics can be found in the APS2/PSW programming user's guide. I have attached copies of the pages from the manual describing how to run the diagnostics. If the Activator is not operating within the calibration limits, Actel will replace the unit. The end user does not have the ability to change Activator settings, he may only verify whether the calibration specifications are being met.

Q: Are all the antifuses checked by the Activator?

A: Every fuse being programmed is checked during the programming sequence. Programming pulses are applied across each fuse individually until current is sensed through the fuse. Once current is sensed, additional "soak" pulses are applied to ensure the fuse is programmed. After soak pulses are applied, the programming voltage is lowered and current is again sensed through the fuse, to verify the sensed current is through the programmed fuse and not due to leakage elsewhere in the device (check 6 test). Each fuse is checked individually as the array is programmed. After all array fuses are programmed, a series of additional "net shorts" tests are performed to verify that no additional fuses have been programmed. Checksum fuses are programmed after the net shorts tests are performed.

Q: What is the probability of getting a correct checksum but having incorrectly programmed fuses?

A: Each fuse is individually verified during programming, and additional programming verification tests are performed before the checksum is programmed, as described above. Programming occurs in this order to ensure that the array fuses are programmed correctly. All units that pass programming are guaranteed to function properly.

Q: How can antifuse resistance be determined? Is it possible that a fuse resistance could be great enough to cause delay greater than the worst case simulated delay?

A: Antifuse resistance can't be directly determined on a programmed unit, and worst case timing is guaranteed for programmed parts. During programming, the current sensed through each fuse is recorded in the .AVI file. It is recommended that customers save the .AVI file each time an RH1280 unit is programmed.

Q: Are electrical characteristics of the device guaranteed after programming? Is it necessary to perform functional tests on the programmed units?

A: The electrical characteristics outlined in the Actel Databook are guaranteed for all devices that pass programming. Additionally, correct functional behavior is guaranteed for all devices that pass programming.